

# **APPENDIX E**

## **Breeding Habitat for Bird, Mammal, Amphibian and Reptile Species of Conservation Priority**

**and**

## **Effects of Management Practices on Bird Species of Conservation Priority**

### **By Landscape Component**

This appendix is intended to serve as a beginning discussion point for implementation of conservation actions. For the grassland landscape components, the first table provided depicts the general characteristics of (grazed) grasslands which will be used by various avian species. These characteristics for mammals, amphibians, and reptiles are not yet identified. The second table provides insight as to the effects of various management practices on the species of conservation priority within the landscape component. It is these types of tools which were identified by partners, particularly those who implement conservation, as useful in on-the-ground management. There is also a table for wetland associated species to serve as discussion for wetland characteristics important to species of conservation priority.

\*It is very important to note that some of this information is still in DRAFT form. These tables were created as supplemental information for the CWCS. The authors should be consulted before citing or using this information. Again, the long-term goal is to edit and expand on these tables over time and create a useful tool for wildlife managers to conserve species of conservation priority.

# Ideal Breeding/Habitat Conditions and Responses to Grazing for SoCP in the Tallgrass Prairie (Red River Valley).

	Breeding Habitat	Minimum Area Requirement (ha)	Idle	Lightly Grazed	Moderately Grazed	Heavily Grazed	Tall Vegetation	Moderate-Tall Vegetation	Short Vegetation	Dense Vegetation	Moderate-Dense Vegetation	Sparse Vegetation	High Forb Cover	Moderate Forb Cover	Low Forb Cover	Thick Litter	Moderate Litter	Low Litter	Bare Ground -- Positive	Bare Ground -- Negative	Shrubs -- Positive	Shrubs -- Negative
<b>BIRDS</b>																						
American Bittern	G/W		X					X			X						X					X
Northern Pintail	G/W																					
Northern Harrier	G/W		X	X	X		X			X						X					X	
Sharp-tailed Grouse	G/S																					
Greater Prairie-chicken	G		X	X		X	X	X	X	X	X	X		X			X					
Willet	G/W	100		X	X				X			X					X					
Upland Sandpiper	G		X	X	X		X	X	X		X			X	X		X			X		X
Marbled Godwit	G/W		X	X	X				X		X	X		X								
Wilson's Phalarope	G/W	100	X	X	X		X					X					X					
Short-eared Owl	G	100	X	X	X		X	X		X						X						
Sedge Wren	G/W	10		X			X			X				X								
Grasshopper Sparrow	G	>30	X	X	X			X			X			X			X					X
Le Conte's Sparrow	G/W		X				X			X				X		X						X
Nelson's Sharp-tailed Sparrow	G/W	5	X				X			X						X						
Dickcissel	G	10	X	X	X			X		X				X			X			X		
Bobolink	G	30	X	X	X		X	X		X	X			X			X			X		X
<b>MAMMALS</b>																						
Pygmy Shrew	G																					
Arctic Shrew	G																					
Plains Pocket Mouse	G																					
Richardson's Ground Squirrel	G																					
<b>REPTILES/AMPHIBIANS</b>																						
Canadian Toad	G/W																					
Northern Prairie Skink	G																					
Smooth Green Snake	G																					
Western Hognose Snake	G																					

X = that habitat type is preferred or acceptable. Or as it relates to the last four columns, that habitat component has positive or negative effects.  
Source: Habitat Requirements and Responses to Grazing of Grassland Birds (Dechant et al. 1999).

# Effects of Management Practices on Avian SoCP in the Tallgrass Prairie (Red River Valley).

	American Bittern	Northern Pintail	Northern Harrier	Sharp-tailed Grouse	Greater Prairie-chicken	Willet	Upland Sandpiper	Marbled Godwit	Wilson's Phalarope	Short-eared Owl	Sedge Wren	Grasshopper Sparrow	Nelson's Sharp-tailed Sparrow	Le Conte's Sparrow	Dickcissel	Bobolink
<i>Grazing Overall</i>	<i>N</i>					<i>B</i>	<i>B</i>	<i>B</i>		<i>B</i>	<i>U</i>	<i>B</i>	<i>U</i>	<i>U</i>		
<i>Grazing -- Light</i>		<i>B</i>			<i>B</i>					<i>B</i>		<i>B</i>				<i>B</i>
<i>Grazing -- Moderate</i>	<i>N</i>		<i>N</i>			<i>B</i>		<i>B</i>	<i>B</i>		<i>N</i>		<i>N</i>	<i>N</i>		
<i>Grazing -- Heavy</i>	<i>NN</i>	<i>N</i>	<i>N</i>		<i>NN</i>		<i>N</i>	<i>B</i>		<i>NN</i>	<i>NN</i>	<i>NN</i>	<i>NN</i>	<i>NN</i>	<i>N</i>	<i>NN</i>
Grazing -- Short Term, 2-4 weeks	N		N		N	B	N	B	U	N		N	N	N	N	N
Grazing -- Rotation	B		B	B		U	B	U	B	B	<i>N</i>	B				B
<i>Grazing -- Season Long</i>	<i>N</i>		<i>N</i>								<i>N</i>	<i>N</i>				
<i>Grazing -- Twice over deferred</i>																
Delayed Haying	B		B	B			B					U				U
Haying on NWRs/WPAs -- Long Term	B		B	B						B	B				B	B
Haying on NWRs/WPAs -- Short Term	N		N	N						N	N				N	N
<i>Mowing</i>	<i>N</i>							<i>B</i>					<i>N</i>			
Prescribed Burning	<i>N</i>		N		<i>B</i>	B	BB	B	<i>B</i>	<i>B</i>	<i>B</i>	B	<i>N</i>		<i>B</i>	<i>B</i>
<i>Years Between Burn</i>	<i>2-5</i>		<i>3-5</i>		<i>3-5</i>		<i>3</i>			<i>2-8</i>		<i>2-4</i>		<i>2-4</i>	<i>3-5</i>	<i>2-4</i>
Wetland Restoration	B		B			B		B	B			N		B		
Wetland Enhancement																
Wetland Creation			N							N						N
Wetland Creation -- Wet Meadow to Type II			N						NN	N	NN		NN	NN		N
Wetland Manipulation/Management on Hayland or Pastures	U								NN							
Re-seed Uplands to DNC	B		B	B		N	N	N		B	B				B	B
<i>Re-seed Uplands to CRP</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>		<i>B</i>			<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>		<i>B</i>
Re-seed Uplands to Native Grass				B		B	B	B				B				B
No Till or Minimum Till							B	B				B				B
Cropping --						N	N	N								
Chemical Fallow												B				B
Predator Fence Enclosures	BB		BB	BB						BB	B				B	B
Tree Planting -- Multi-row Shelterbelts								N								
<i>Tree Removal</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>U</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Weed Control																

## Breeding Habitat Categories

G = Grassland  
W = Wetland  
G/W = Grassland/Wetland Complex  
G/S = Grassland/Shrubland  
G/S/T = Grassland/Shrubland/Trees

## Management Practice Effect

BB = Very Beneficial  
B = Beneficial  
N = Negative  
NN = Very Negative  
U = Unknown

## Color/text Codes

Black = from "A Review of Wildlife Management Practices in North Dakota" 1993.

Red & italicized = additions from current literature or personal communications.

Ideal Breeding/Habitat Conditions and Responses to Grazing for SoCP in the Eastern Mixed-grass Prairie (Drift Prairie).

	Breeding Habitat	Minimum Area Requirement (ha)	Idle	Lightly Grazed	Moderately Grazed	Heavily Grazed	Tall Vegetation	Moderate-Tall Vegetation	Short Vegetation	Dense Vegetation	Moderate-Dense Vegetation	Sparse Vegetation	High Forb Cover	Moderate Forb Cover	Low Forb Cover	Thick Litter	Moderate Litter	Low Litter	Bare Ground -- Positive	Bare Ground -- Negative	Shrubs -- Positive	Shrubs -- Negative
BIRDS																						
American Bittern	G/W		X					X			X						X					X
Northern Pintail	G/W																					
Northern Harrier	G/W		X	X	X		X			X						X					X	
Swainson's Hawk	G/S/T																					
Ferruginous Hawk	G/S/T	2000?	X	X	X	X		X	X													
Sharp-tailed Grouse	G/S																					
Greater Prairie Chicken	G		X	X		X	X	X	X	X	X	X		X				X				
Willet	G/W	100		X	X				X			X						X				
Upland Sandpiper	G		X	X	X		X	X	X		X			X	X		X			X		X
Marbled Godwit	G/W		X	X	X				X		X	X		X								
Wilson's Phalarope	G/W	100	X	X	X			X				X						X				
Short-eared Owl	G	100	X	X	X		X	X		X						X						
Loggerhead Shrike	G/S		X					X													X	
Sedge Wren	G/W	10		X			X			X				X								
Sprague's Pipit	G	190	X	X	X			X			X	X					X					X
Lark Bunting	G			X	X			X	X		X			X			X				X	
Grasshopper Sparrow	G	>30	X	X	X			X			X			X			X					X
Baird's Sparrow	G	700	X	X	X			X			X			X			X					X
Le Conte's Sparrow	G/W		X				X			X				X		X						X
Nelson's Sharp-tailed Sparrow	G/W	5	X				X			X						X						
Chestnut-collared Longspur	G	700		X	X				X			X						X	X			X
Dickcissel	G	10	X	X	X			X		X				X			X			X		
Bobolink	G	30	X	X	X		X	X		X	X			X			X			X		X
MAMMALS																						
Arctic Shrew	G																					
Pygmy Shrew	G																					
Richardson's Ground Squirrel	G																					
REPTILES/AMPHIBIANS																						
Plains Spadefoot	G/W																					
Canadian Toad	W																					
Smooth Green Snake	G																					
Western Hognose Snake	G																					

X = that habitat type is preferred or acceptable. Or as it relates to the last four columns, that habitat component has positive or negative effects.  
Source: Habitat Requirements and Responses to Grazing of Grassland Birds (Dechant et al. 1999).

# Effects of Management Practices on Avian SoCP in the Drift Prairie.

	American Bittern	Northern Pintail	Northern Harrier	Swainson's Hawk	Ferruginous Hawk	Sharp-tailed Grouse	Upland Sandpiper	Marbled Godwit	Wilson's Phalarope	Sedge Wren	Sprague's Pipit	Lark Bunting	Grasshopper Sparrow	Baird's Sparrow	Le Conte's Sparrow	Nelson's Sharp-tailed Sparrow	Chestnut-collared Longspur	Dickcissel	Bobolink
<i>Grazing Overall</i>	<i>N</i>						<i>B</i>	<i>B</i>		<i>U</i>			<i>B</i>	<i>B</i>	<i>U</i>	<i>U</i>	<i>B</i>		
<i>Grazing -- Light</i>		<i>B</i>			<i>N</i>								<i>B</i>	<i>B</i>					<i>B</i>
<i>Grazing -- Moderate</i>	<i>N</i>		<i>N</i>					<i>B</i>	<i>B</i>	<i>N</i>					<i>N</i>	<i>N</i>			
<i>Grazing -- Heavy</i>	<i>NN</i>	<i>N</i>	<i>N</i>		<i>B</i>		<i>N</i>	<i>B</i>		<i>NN</i>			<i>NN</i>	<i>NN</i>	<i>NN</i>	<i>NN</i>	<i>N</i>	<i>N</i>	<i>NN</i>
Grazing -- Short Term, 2-4 weeks	N		N		B		N	B	U				N	B	N	N	B	N	N
Grazing -- Rotation	B		B		N	B	B	U	B	<i>N</i>			B	B			N		B
<i>Grazing -- Season Long</i>	<i>N</i>		<i>N</i>							<i>N</i>			<i>N</i>						
<i>Grazing -- Twice over deferred</i>																			
Delayed Haying	B		B			B	B						U	U					U
Haying on NWRs/WPAs - Long Term	B		B			B				B								B	B
Haying on NWRs/WPAs - Short Term	N		N			N				N								N	N
<i>Mowing</i>	<i>N</i>							<i>B</i>								<i>N</i>			
Prescribed Burning	<i>N</i>		<i>N</i>		<i>B</i>		<i>BB</i>	<i>B</i>	<i>B</i>	<i>B</i>			<i>B</i>	<i>BB</i>		<i>N</i>	<i>B</i>	<i>B</i>	<i>B</i>
<i>Years Between Burn</i>	<i>2-5</i>		<i>3-5</i>				<i>3</i>						<i>2-4</i>	<i>2-10</i>	<i>2-4</i>			<i>3-5</i>	<i>2-4</i>
Wetland Restoration	B		B					B	B				N		B				
Wetland Enhancement																			
Wetland Creation			N																N
Wetland Creation - Wet Meadow to Type II			N						NN	NN					NN	NN			N
Wetland Manipulation Management on Hayland or Pastures	U								NN										
Re-seed Uplands to DNC	B		B			B	N	N		B							N	B	B
<i>Re-seed Uplands to CRP</i>	<i>B</i>	<i>B</i>	<i>B</i>			<i>B</i>	<i>B</i>			<i>B</i>			<i>B</i>		<i>B</i>	<i>B</i>	<i>B</i>		<i>B</i>
Re-seed Uplands to Native Grass						B	B	B					B	B					B
Cattail Control - Use of RODEO	N		N			N			B										
Cattail Control - Burning	N		N			N			B										
No Till or Minimum Till							B	B					B	B			B		B
Cropping -							N	N									N		
Chemical Fallow													B	B			B		B
Island Trapping			B						B										
Island Creation/Peninsula Cutoffs			B						B										
Predator Fence Enclosures	BB		BB			B				B								B	B
Tree Planting -- Multi-row Shelterbelts								N									N		

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## Color/text Codes

Black = from "A Review of Wildlife Management Practices in North Dakota" 1993.

Red & italicized = additions from current literature or personal communications.

Ideal Breeding/Habitat Conditions and Responses to Grazing for SoCP in the Mixed-grass Prairie (Missouri Coteau).

	Breeding Habitat	Minimum Area Requirement (ha)	Idle	Lightly Grazed	Moderately Grazed	Heavily Grazed	Tall Vegetation	Moderate-Tall Vegetation	Short Vegetation	Dense Vegetation	Moderate-Dense Vegetation	Sparse Vegetation	High Forb Cover	Moderate Forb Cover	Low Forb Cover	Thick Litter	Moderate Litter	Low Litter	Bare Ground -- Positive	Bare Ground -- Negative	Shrubs -- Positive	Shrubs -- Negative
BIRDS																						
American Bittern	G/W		X					X			X						X					X
Northern Pintail	G/W																					
Northern Harrier	G/W		X	X	X		X			X						X					X	
Swainson's Hawk	G/S/T																					
Ferruginous Hawk	G/S/T	2000?	X	X	X	X		X	X													
Sharp-tailed Grouse	G/S																					
Willet	G/W	100		X	X				X			X						X				
Upland Sandpiper	G		X	X	X		X	X	X		X			X	X		X			X		X
Marbled Godwit	G/W		X	X	X				X		X	X		X								
Wilson's Phalarope	G/W	100	X	X	X			X				X						X				
Short-eared Owl	G	100	X	X	X		X	X		X						X						
Loggerhead Shrike	G/S		X					X													X	
Sedge Wren	G/W	10		X			X			X				X								
Sprague's Pipit	G	190	X	X	X			X			X	X					X					X
Lark Bunting	G			X	X			X	X		X			X			X				X	
Grasshopper Sparrow	G	>30	X	X	X			X			X			X			X					X
Baird's Sparrow	G	700	X	X	X			X			X			X			X					X
Le Conte's Sparrow	G/W		X				X			X				X		X						X
Nelson's Sharp-tailed Sparrow	G/W	5	X				X			X						X						
Chestnut-collared Longspur	G	700		X	X				X			X						X	X			X
Dickcissel	G	10	X	X	X			X		X				X			X			X		
Bobolink	G	30	X	X	X		X	X		X	X			X			X			X		X
MAMMALS																						
Richardson's Ground Squirrel	G																					
REPTILES/AMPHIBIANS																						
Plains Spadefoot	G/W																					
Canadian Toad	W																					
Smooth Green Snake	G																					
Western Hognose Snake	G																					

X = that habitat type is preferred or acceptable. Or as it relates to the last four columns, that habitat component has positive or negative effects.  
Source: Habitat Requirements and Responses to Grazing of Grassland Birds (Dechant et al. 1999).

# Effects of Management Practices on SoCP in the Missouri Coteau.

	American Bittern	Northern Pintail	Northern Harrier	Swainson's Hawk	Ferruginous Hawk	Sharp-tailed Grouse	Willet	Upland Sandpiper	Marbled Godwit	Wilson's Phalarope	Short-eared Owl	Loggerhead Shrike	Sedge Wren	Sprague's Pipit	Lark Bunting	Grasshopper Sparrow	Baird's Sparrow	Le Conte's Sparrow	Nelson's Sharp-tailed Sparrow	Chestnut-collared Longspur	Dickcissel	Bobolink
<i>Grazing Overall</i>	<i>N</i>						<i>B</i>	<i>B</i>	<i>B</i>		<i>B</i>		<i>U</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>U</i>	<i>U</i>	<i>B</i>		
<i>Grazing -- Light</i>		<i>B</i>			<i>N</i>						<i>B</i>			<i>B</i>		<i>B</i>	<i>B</i>					<i>B</i>
<i>Grazing -- Moderate</i>	<i>N</i>		<i>N</i>				<i>B</i>		<i>B</i>	<i>B</i>			<i>N</i>					<i>N</i>	<i>N</i>			
<i>Grazing -- Heavy</i>	<i>NN</i>	<i>N</i>	<i>N</i>		<i>B</i>			<i>N</i>	<i>B</i>		<i>NN</i>		<i>NN</i>	<i>NN</i>	<i>N</i>	<i>NN</i>	<i>NN</i>	<i>NN</i>	<i>NN</i>	<i>N</i>	<i>N</i>	<i>NN</i>
Grazing -- Short Term, 2-4 weeks	N		N		B		B	N	B	U	N			B	U	N	B	N	N	B	N	N
Grazing -- Rotation	B		B		N	B	U	B	U	B	B		<i>N</i>	B	B	B	B			N		B
<i>Grazing -- Season Long</i>	<i>N</i>		<i>N</i>										<i>N</i>			<i>N</i>						
<i>Grazing -- Twice over deferred</i>																						
Delayed Haying	B		B			B		B								U	U					U
Haying on NWRs/WPAs - Long Term	B		B			B					B		B		B						B	B
Haying on NWRs/WPAs -- Short Term	N		N			N					N		N		N						N	N
<i>Mowing</i>	<i>N</i>								<i>B</i>										<i>N</i>			
Prescribed Burning	<i>N</i>		<i>N</i>		<i>B</i>		<i>B</i>	<i>BB</i>	<i>B</i>	<i>B</i>	<i>B</i>		<i>B</i>	<i>BB</i>	<i>B</i>	<i>B</i>	<i>BB</i>		<i>N</i>	<i>B</i>	<i>B</i>	<i>B</i>
<i>Years Between Burn</i>	<i>2-5</i>		<i>3-5</i>					<i>3</i>			<i>2-8</i>			<i>2-4</i>		<i>2-4</i>	<i>2-10</i>	<i>2-4</i>			<i>3-5</i>	<i>2-4</i>
Wetland Restoration	B		B				B		B	B						N		B				
Wetland Enhancement																						
Wetland Creation			N								N											N
Wetland Creation - Wet Meadow to Type II			N							N	N		NN					NN	NN			N
Wetland Manipulation Management on Hayland or Pastures	U									N												
Re-seed Uplands to DNC	B		B			B	N	N	N		B		B		B					N	B	B
<i>Re-seed Uplands to CRP</i>	<i>B</i>	<i>B</i>	<i>B</i>			<i>B</i>		<i>B</i>			<i>B</i>		<i>B</i>		<i>B</i>	<i>B</i>		<i>B</i>	<i>B</i>	<i>B</i>		<i>B</i>
Re-seed Uplands to Native Grass						B	B	B	B							B	B					B
Cattail Control -- Use of RODEO	N		N			N				B												
Cattail Control - Burning	N		N			N				B												
No Till or Minimum Till								B	B						B	B	B			B		B
Cropping -							N	N	N											N		
Chemical Fallow															B	B	B			B		B
Island Trapping			B							B												
Island Creation/Peninsula Cutoffs			B							B												
Predator Fence Exclosures	BB		BB			B					BB		B		B						B	B
Tree Planting -- Multi-row Shelterbelts									N			B		N						N		

## Breeding Habitat Categories

G = Grassland  
W = Wetland  
G/W = Grassland/Wetland Complex  
G/S = Grassland/Shrubland  
G/S/T = Grassland/Shrubland/Trees

## Management Practice Effect

BB = Very Beneficial  
B = Beneficial  
N = Negative  
NN = Very Negative  
U = Unknown

## Color/text Codes

Black = from "A Review of Wildlife Management Practices in North Dakota" 1993.

Red & italicized = additions from current literature or personal communications.

Ideal Breeding/Habitat Conditions and Responses to Grazing for SoCP in the Western Mixed-grass Prairie (Missouri Slope).

	Breeding Habitat	Minimum Area Requirement (ha)	Idle	Lightly Grazed	Moderately Grazed	Heavily Grazed	Tall Vegetation	Moderate-Tall Vegetation	Short Vegetation	Dense Vegetation	Moderate-Dense Vegetation	Sparse Vegetation	High Forb Cover	Moderate Forb Cover	Low Forb Cover	Thick Litter	Moderate Litter	Low Litter	Bare Ground – Positive	Bare Ground – Negative	Shrubs – Positive	Shrubs – Negative
BIRDS																						
Northern Pintail	G/W																					
Northern Harrier	G/W		X	X	X		X			X						X					X	
Ferruginous Hawk	G/S/T	2000?	X	X	X	X		X	X													
Swainson's Hawk	G/S/T																					
Golden Eagle	G/S	2000?																				
Prairie Falcon	G/S	2000?																				
Sharp-tailed Grouse	G/S																					
Greater Sage-Grouse	Sage/G																					
Upland Sandpiper	G		X	X	X		X	X	X		X			X	X		X			X		X
Long-billed Curlew	G				X				X			X		X								
Wilson's Phalarope	G/W	100	X	X	X			X				X						X				
Burrowing Owl	G	35			X	X			X			X						X	X			
Short-eared Owl	G	100	X	X	X		X	X		X						X						
Loggerhead Shrike	G/S		X					X												X		
Sprague's Pipit	G	190	X	X	X			X			X	X					X					X
Brewer's Sparrow	Sage/G																					
Lark Bunting	G			X	X			X	X		X			X			X				X	
Grasshopper Sparrow	G	>30	X	X	X			X			X			X			X					X
Baird's Sparrow	G	700	X	X	X			X			X			X			X					X
Chestnut-collared Longspur	G	700		X	X				X			X						X	X			X
McCown's Longspur	G				X	X			X			X						X	X			
MAMMALS																						
Hispid Pocket Mouse	G																					
Sagebrush Vole	Sage/G																					
Black-tailed Prairie Dog	G																					
REPTILES/AMPHIBIANS																						
Plains Spadefoot	G/W																					
Short-horned Lizard	G/S																					
Northern Sagebrush Lizard	Sage/G																					
Western Hognose Snake	G																					

X = that habitat type is preferred or acceptable. Or as it relates to the last four columns, that habitat component has positive or negative effects.  
Source: Habitat Requirements and Responses to Grazing of Grassland Birds (Dechant et al. 1999).



## Effects of Management Practices on Avian SoCP in the Missouri Slope.

	Northern Pintail	Northern Harrier	Ferruginous Hawk	Swainson's Hawk	Golden Eagle	Prairie Falcon	Sharp-tailed Grouse	Greater Sage-Grouse	Upland Sandpiper	Long-billed Curlew	Wilson's Phalarope	Burrowing Owl	Short-eared Owl	Loggerhead Shrike	Sprague's Pipit	Brewer's Sparrow	Lark Bunting	Grasshopper Sparrow	Baird's Sparrow	Chestnut-collared Longspur	McCown's Longspur
<i>Grazing Overall</i>									<i>B</i>			<i>B</i>	<i>B</i>		<i>B</i>		<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	
<i>Grazing -- Light</i>	<i>B</i>		<i>N</i>									<i>N</i>	<i>B</i>		<i>B</i>			<i>B</i>	<i>B</i>		
<i>Grazing -- Moderate</i>		<i>N</i>									<i>B</i>										
<i>Grazing -- Heavy</i>	<i>N</i>	<i>N</i>	<i>B</i>						<i>N</i>			<i>BB</i>	<i>NN</i>		<i>NN</i>		<i>N</i>	<i>NN</i>	<i>NN</i>	<i>N</i>	
Grazing -- Short Term, 2-4 weeks		N	B						N		U		N		B		U	N	B	B	
Grazing -- Rotation		B	N				B		B		B	N	B		B		B	B	B	N	
<i>Grazing -- Season Long</i>		<i>N</i>																<i>N</i>			
<i>Grazing -- Twice over deferred</i>																					
Delayed Haying		B					B		B									U	U		
Haying on NWRs/WPAs - Long Term		B					B						B				B				
Haying on NWRs/WPAs - Short Term		N					N						N				N				
<i>Mowing</i>																					
Prescribed Burning		N	B						BB		<i>B</i>		<i>B</i>		BB		B	B	BB	B	
<i>Years Between Burn</i>		<i>3-5</i>							<i>3</i>				<i>2-8</i>		<i>2-4</i>			<i>2-4</i>	<i>2-10</i>		
Wetland Restoration		B									B							N			
Wetland Enhancement																					
Wetland Creation		N											N								
Wetland Creation - Wet Meadow to Type II		N									NN		N								
Wetland Creation - West of Missouri R.																					
Wetland Manipulation/Management on Hayland or Pastures											NN										
Re-seed Uplands to DNC		B					B		N				B				B			N	
<i>Re-seed Uplands to CRP</i>	<i>B</i>	<i>B</i>					<i>B</i>		<i>B</i>				<i>B</i>				<i>B</i>	<i>B</i>		<i>B</i>	
Re-seed Uplands to Native Grass							B		B									B	B		
Cattail Control - Use of RODEO		N					N				B										
Cattail Control - Burning		N					N				B										
No Till or Minimum Till									B								B	B	B	B	
Cropping -									N											N	
Chemical Fallow																	B	B	B	B	
Island Trapping		B									B										
Island Creation/Peninsula Cutoffs		B									B										
Predator Fence Enclosures		BB					BB						BB				B				
Tree Planting - Multi-row Shelterbelts														B	N					N	
Weed Control																					
Gravel Shoreline																					

### Breeding Habitat Categories

G = Grassland  
W = Wetland  
G/W = Grassland/Wetland Complex  
G/S = Grassland/Shrubland  
G/S/T = Grassland/Shrubland/Trees  
Sage/G = Big Sagebrush/Grassland

### Management Practice Effect

BB = Very Beneficial  
B = Beneficial  
N = Negative  
NN = Very Negative  
U = Unknown

### Color/text Codes

Black = from "A Review of Wildlife Management Practices in North Dakota" 1993.

Red & italicized = additions from current literature or personal communications.

# Ideal Breeding/Habitat Conditions for SoCP in Wetlands or Lakes.

			Wetland Type							Potential Associated NWI Classification							
	Breeding Habitat	Wetland Size (ha)	Water Depth (cm)	Temporary	Seasonal	Semipermanent	Permanent	Permanent Wood-bordered	Alkali	Fens	Cropland Ponds	System (Subsystem)	Class	Water Regime	Water Chemistry	Special Modifiers	Cover Type
BIRDS																	
Horned Grebe	W	1-10	20-50			X	X					P	AB(3,4), EM(1) RB, UB, AB, OW	C, F, H	9, 0	h, x	3
American White Pelican	W		<250			X				X		L(1)		H, G, K		h	4
American Bittern	GW	3-180	10-90		X	X	X		X		X	P	EM(1)	A, B, C		h	1, 2
Northern Pintail	GW			X	X	X						P, L(2)	AB, EM(1)	A, B, C, F, H, J, K	9	d, f, h, x	3, 4
Canvasback	W	<0.5	30-90			X						P, L	AB, EM(1)	F	9	h	2, 3
Redhead	W	0.5-0.8	20-150		X	X						P, L	AB, EM(1)	F, C	9	h	2, 3
Northern Harrier	GW			X	X	X				X	X	P	EM(1)	B, A, C, F, H			
Yellow Rail	W	0.5-1000	0-20							X		P	EM(1)	B, A	0		1
Whooping Crane		>40, <4	10-100									P, L, R	EM, UB(3,4), AB, US	C, F, A, H			4
Piping Plover	W		<5						X			R(2), L(2)	US(1,2), UB	A, C, F, H	7, 8		4
American Avocet	W		<20			X	X		X		X	P, L(2), R(2)	UB(1,2,3), US(1,2,3)	F, H, G	7, 8, 9, 0	d, f, h	4
Willet	GW		<20	X	X	X	X				X	P, L(2), R(2)	US(1,2,3)	F, C, H, G	7, 8, 9, 0	d, f, h	4
Long-billed Curlew	GW		<20														
Marbled Godwit	GW		<20	X	X	X	X		X		X	P, L(2), R(2)	US(1,2,3)	F, C, H, G	7, 8, 9, 0	d, f, h	4
Wilson's Phalarope	GW			X	X	X	X		X	X		P, L(2), R(2)	US(1,2,3), EM	F, C, H, G, A, B	7, 8, 9, 0	d, f, h, x	4
Franklin's Gull	W		30-130			X	X		X		X	P, L(2)	EM(1)	C, F, H, J, K		h	2
Black Tern	W	>5	50-120		X	X	X					P, L(2)	EM(1)	F, C, H, J	9, 0	h	2
Short-eared Owl																	
Sedge Wren	GW			X	X	X				X		P	EM(1)	B, A, F	0		1
Le Conte's Sparrow	GW			X						X		P	EM(1)	B	0		1
Nelson's Sharp-tailed Sparrow	GW				X	X				X		P	EM(1)	B	0		1
MAMMALS																	
Arctic Shrew	GW/R																
Pygmy Shrew	GW/R																
REPTILES/AMPHIBIANS																	
Plains Spadefoot																	
Plains Spadefoot	GW			X	X	X	X			X	X						
Canadian Toad	GW			X	X	X	X			X	X						
Common Snapping Turtle	W					X	X	X									

# Ideal Breeding/Habitat Conditions and Responses to Grazing for SoCP in the Badlands.

	Breeding Habitat	Minimum Area Requirement (ha)	Substrate Height (m)	Idle	Lightly Grazed	Moderately Grazed	Heavily Grazed	Tall Vegetation	Moderate-Tall Vegetation	Short Vegetation	Dense Vegetation	Moderate-Dense Vegetation	Sparse Vegetation	High Forb Cover	Moderate Forb Cover	Low Forb Cover	Thick Litter	Moderate Litter	Low Litter	Bare Ground -- Positive	Bare Ground -- Negative	Shrubs -- Positive	Shrubs -- Negative
BIRDS																							
Swainson's Hawk																							
Golden Eagle	G/S	2000?	0-107																				
*Peregrine Falcon	G		20-200																				
Prairie Falcon	G/S	2000?	3-140																				
Sharp-tailed Grouse	G/S																						
Burrowing Owl	G	35				X	X			X			X						X	X			
Loggerhead Shrike	G/S			X					X													X	
Lark Bunting	G				X	X			X	X		X			X			X				X	
Grasshopper Sparrow	G	>30		X	X	X			X			X			X			X					X
MAMMALS																							
Western Small-footed Myotis																							
Long-eared Myotis																							
Long-legged Myotis																							
Black-tailed Prairie Dog	G																						
*Black-footed Ferret	G																						
*Swift Fox	G																						
REPTILES/AMPHIBIANS																							
Plains Spadefoot	G/W																						
Short-horned Lizard	G/S																						
Northern Sagebrush Lizard	Sage/G																						

X = that habitat type is preferred or acceptable. Or as it relates to the last four columns, that habitat component has positive or negative effects.  
Source: Habitat Requirements and Responses to Grazing of Grassland Birds (Dechant et al. 1999).

## Glossary/Definitions

### Terrestrial Definitions

**Breeding Habitat.** G = Grassland; W = Wetland; S = Shrubland; T = Trees; R = Riparian; G/W = Grassland/Wetland; W/G = Wetland/Grassland; G/S = Grassland/Shrubland;

**Minimum Area requirements:** Provides minimum area requirements for species exhibiting area sensitivity.

**Minimum Substrate Height.**

**Idle.** An area of land left undisturbed or unmanaged (e.g., not burned, mowed, or grazed) during a given time period.

**Light Grazing.** A comparative term which indicates that the stocking rate of a pasture is relatively less than that of other pastures. Sometimes erroneously used to mean under use.

**Moderate Grazing.** A comparative term which indicates that the stocking rate of a pasture is between the rates of other pastures. Sometimes erroneously used to mean proper use.

**Heavy Grazing.** A comparative term which indicates that the stocking rate of a pasture is relatively greater than that of other pastures. Sometimes erroneously used to mean overuse.

**Tall Vegetation.** A comparative term which indicates that the vegetation is tall relative to other areas.

**Moderate-Tall Vegetation.** A comparative term which indicates that the vegetation is between heights relative to other areas.

**Short Vegetation.** A comparative term which indicates that the vegetation is short relative to other areas.

**Dense Vegetation.** A comparative term which indicates that the vegetation is thick relative to other areas.

**Moderate-Dense Vegetation.** A comparative term which indicates that the vegetation is between thicknesses relative to other areas.

**Sparse Vegetation.** A comparative term which indicates that the vegetation is scarce relative to other areas.

**High Forb Cover.** A comparative term which indicates that a great amount of forbs are present relative to other areas.

**Moderate Forb Cover.** A comparative term which indicates that an intermediate amount of forbs are present relative to other areas.

**Low Forb Cover.** A comparative term which indicates that small amounts of forbs are present relative to other areas.

**Thick Litter.** A comparative term which indicates that substantial dead vegetation accumulation is present relative to other areas.

**Moderate Litter.** A comparative term which indicates that an intermediate amount of vegetation accumulation is present relative to other areas.

**Low Litter.** A comparative term which indicates that a small amount of dead vegetation accumulation is present relative to other areas.

**Bare Ground – Positive.** A comparative term which indicates that the presence of bare ground, or no vegetation present, has beneficial impacts on a species.

**Bare Ground – Negative.** A comparative term which indicates that the presence of bare ground, or no vegetation present, has negative impacts on a species.

**Shrubs – Positive.** A comparative term which indicates that the presence of shrubs has beneficial impacts on a species.

**Shrubs – Negative.** A comparative term which indicates that the presence of shrubs has negative impacts on a species.

### Aquatic Definitions

(Cowardin et al. 1979, Stewart and Kantrud 1979, Stewart 1975)

**Wetland Size.** Provides minimum area requirements.

**Water Depth.** Provides minimum preferred water depth.

**Temporary (Class 2, Temporarily Flooded).** Surface water present for a brief period during the early spring following snowmelt and occasionally for several days following heavy rainstorms during the late spring, summer, and fall.

**Seasonal (Class 3, Seasonally Flooded).** Surface water is present for extended periods in the spring and early summer, but disappears during the late summer and fall in most years.

**Semipermanent (Class 4, Semipermanently Flooded).** Surface water is present throughout most of the spring and summer and into the fall and winter in most years. During drought years, water may disappear as early as midsummer.

**Permanent (Class 5, Permanently Flooded).** Surface water is present throughout the year in all years.

**Permanent Wood-bordered.** Deep surface water is present throughout the year in all years and the periphery of the wetland is predominantly woodland.

**Alkali (Class 6, Eusaline or Hpersaline).** Highly saline shallow water and alkali salt flats.

**Fens (Saturated).** Surface water is sometimes lacking but bottom soils saturated by alkaline ground-water seepage.

**Cropland Ponds.** Occur in basins with soils that are frequently cultivated.

## Potential Associated NWI Classification Definitions

### **System (Subsystem).**

(R) Riverine. Water within a channel flowing either permanently or intermittently (rivers).

(2) Lower Perennial. Low gradient, slow velocity, well developed floodplain, sand and mud substrate, oxygen deficits at times.

(3) Upper Perennial. High gradient, fast velocity, poorly developed floodplain, stone and rock substrate, high oxygen levels

(4) Intermittent. Periodic flows, isolate pools possible.

(L) Lacustrine. Water in a depression, generally greater than 20 acres (lakes).

(1) Limnetic. Deep lake, water deeper than 2 meters at low lake.

(2) Littoral. Shallow lakes and shorelines of deeper lakes, water depth less than 2 meters at low lake.

(P) Palustrine. Wetlands generally less than 20 acres and less than 2 meters deep (marshes).

### **Class.**

(RB) Rock Bottom. Stones, boulders, bedrock; at least semipermanently flooded; less than 30% vegetated.

Bedrock (1), Rubble (2)

(UB) Unconsolidated Bottom. Cobbles, sand, gravel, mud; at least semipermanently flooded; less than 30% vegetated.

Cobble-Gravel (1), Sand (2), Mud (3), Organic (4)

(AB) Aquatic Bed. Plants growing on or below the water surface; at least seasonally flooded.

Algal (1), Aquatic Moss (2), Rooted Vascular (3), Floating Vascular (4)

(RS) Rocky Shore. Stones, boulders, bedrock; seasonally flooded or less, less than 30% vegetated.

Bedrock (1), Rubble (2)

(UB) Unconsolidated Shore. Cobbles, sand, gravel, mud; seasonally flooded or less; less than 30% vegetated.

Cobble-Gravel (1), Sand (2), Mud (3), Organic (4), Vegetated (5)

(EM) Emergent. Erect, rooted, herbaceous hydrophytes; all water regimes (persistent and nonpersistent).

Persistent (1). Dominated by species that normally remain standing at least until the beginning of the next growing season.

Nonpersistent (2). Dominated by plants which fall to the surface of the substrate or below the surface of the water at the end of each growing season; at certain seasons of the year, there are no obvious signs of emergent vegetation.

### **Water Regime.**

(A) Temporarily Flooded. Surface water present for brief periods during the growing season.

(B) Saturated. Substrate saturated to the surface for extended periods, but surface water is seldom present.

(C) Seasonally Flooded. Surface water is present for extended periods in the growing season, but is absent by the end of the season in most years.

- (F) Semipermanently Flooded. Surface water is present throughout the growing season in most years.
- (G) Intermittently Exposed. Surface water persists in most years except during extreme drought.
- (H) Permanently Flooded. Surface water is present throughout the year in all years.
- (J) Intermittently Flooded. Substrate usually exposed, but surface water is present for variable periods without seasonal periodicity.
- (K) Artificially Flooded. Amount and duration of flooding is controlled by pumps in combination with dams.

#### **Water Chemistry.**

- (7) Hypersaline.
- (8) Eusaline
- (9) Mixosaline
- (0) Fresh

#### **Special Modifiers.**

- (d) Partially Drained/Ditched. Water level is artificially lowered but soil moisture is sufficient to support hydrophytes.
- (f) Farmed. Soil surface has been mechanically or physically altered for production of crops.
- (h) Diked/Impounded. Created by a barrier obstructing the outflow or inflow of water.
- (x) Excavated. Lies within a basin or channel excavated by man.

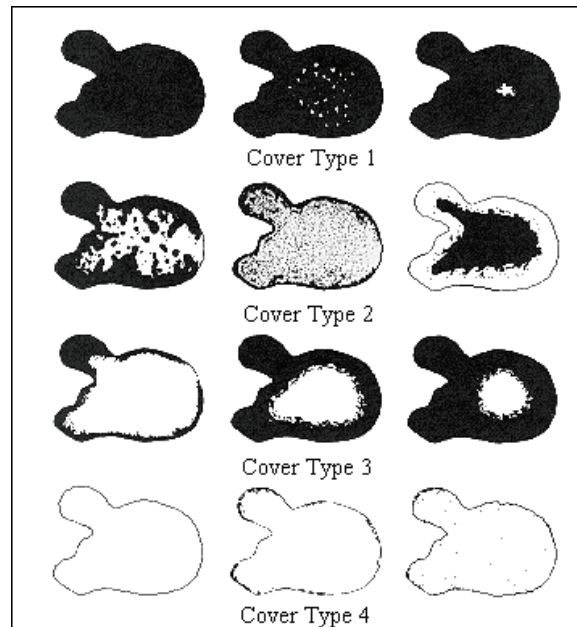
#### **Cover Type:**

Cover Type 1. Closed stands of emergents with open water or bare soil covering less than 5 percent of the wetland area.

Cover Type 2. Open water or bare soil covering 5 to 95 percent of the wetland area, with scattered dense patches or diffuse open stands of emergent cover. Closed stands of emergents, located in the central portion of a pond or lake and surrounded by open water along the shallow margins, are included in this cover type.

Cover Type 3. Central expanses of open water or bare soil (comprising more than 5 percent of the wetland area) surrounded by peripheral bands of emergent cover averaging 6 feet or more in width.

Cover Type 4. Open water or bare soil covers more than 95 percent of the wetland area. This cover type also includes small ponds in which emergent cover is restricted to marginal bands less than 6 feet in average width.



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